

2425/201
CROP PRODUCTION II, SOIL
FERTILITY AND PLANT NUTRITION
June/July 2017
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

**DIPLOMA IN AGRICULTURE
MODULE II**

CROP PRODUCTION II, SOIL FERTILITY AND PLANT NUTRITION

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;

Non-programmable scientific calculator.

This paper consists of TWO sections; A and B.

Answer any THREE questions from section A and any TWO questions from section B in the answer booklet provided.

All questions carry equal marks.

Maximum marks for each part of a question are indicated.

Candidates should answer the questions in English.

This paper consists of 3 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A: CROP PRODUCTION II (60 marks)

Answer any THREE questions from this section.

1. (a) Describe annual pruning in coffee. (10 marks)
- (b) Describe armillaria root rot in tea with respect to:
 - (i) cause;
 - (ii) symptoms;
 - (iii) prevention. (10 marks)
2. (a) Explain cassava production with respect to:
 - (i) planting materials;
 - (ii) establishment. (12 marks)
- (b) Highlight the advantages of establishing paddy rice using seedlings. (8 marks)
3. (a) Explain any six management practices of a ratoon crop in sugarcane. (12 marks)
- (b) Describe rosette disease in groundnuts with respect to:
 - (i) cause;
 - (ii) symptoms;
 - (iii) control. (8 marks)
4. (a) Explain any four benefits of early land preparation in wheat. (8 marks)
- (b) Describe cocoyam production with respect to:
 - (i) ecological requirements;
 - (ii) land preparation;
 - (iii) crop establishment. (12 marks)
5. Explain tobacco production with respect to:
 - (a) benefits of topping;
 - (b) harvesting process; *flue cure air - flue curing*
 - (c) challenges facing tobacco industry. (20 marks)

*Answer
any one
out of
any three
from
the above*



SECTION A: SOIL FERTILITY AND PLANT NUTRITION (40 marks)

Answer any TWO questions from this section.

*pH
flooding
Temp
O₂ water*

(a) Describe the factors that influence denitrification process. (10 marks)

(b) The horticultural field used for kale production showed stunted plants with purple leaves. If the plant tissues from the field tested high in nitrates:

- (i) identify the nutrient that was deficient;
 - (ii) explain the possible causes of the deficient nutrient.
- (10 marks)

*potassium
phosphorous
presence of Ca²⁺
presence of acidity*

7. (a) Using chemical equations, explain how calcium oxide neutralises soil acidity. (5 marks)

(b) The amount of calcium hydroxide required to change the pH of the soil from 5.5 to 7.0 is 6 milliequivalent per 100g of soil. Given that:

Average soil density = 2000 kg/m³;

Hectare furrow slice = 10 cm;

Relative atomic masses for Ca = 40, H = 1, O = 16 and C = 12.

Determine the amount of calcium carbonate required for one hectare of land for the same soil sample. (15 marks)

8. (a) Explain the factors that affect nutrient absorption in plants. (12 marks)

(b) Nitrogenous fertilizers are highly soluble and easily leached. Highlight the measures that may improve their utilization. (8 marks)

*0.5m
Temp
water
pH*

*moisture of soil
C.E.C
- Temp
- Moisture
- light
- pH
- soil type*

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N₂ + O₂ → NO₂

